What is claimed is:

1. A method for reducing the concentration of an analyte in a blood cell suspension, the method comprising:

(i) providing a starting blood cell suspension in a volume greater than 50 mL, the blood cell suspension comprising blood cells and extracellular fluid; and

(ii) washing the starting blood cell suspension with a wash solution under conditions sufficient to lower the concentration of the analyte at least 10^3-fold relative to the analyte concentration in the starting blood cell suspension, wherein the blood cells of the blood cell suspension retain viability after a storage period of greater than 21 days at 4 °C in a storage solution.

2. The method of claim 1, wherein the washing comprises

(i) centrifuging the starting blood cell composition to form a pelleted cell fraction and a supernatant;

(ii) removing the supernatant from the pelleted cell fraction;

(iii) adding washing solution to the pelleted cell fraction; and.

(iv) resuspending the pelleted cell fraction in the washing solution to form a resuspended cell suspension;

(v) optionally repeating steps (i) - (iv); and

(vi) resuspending the pelleted cell fraction in a storage solution.

3. The method of claim 2, wherein the analyte is a small molecule.

4. The method of claim 3, wherein the small molecule is an ethyleneimine oligomer, phenothiazine derivative, acridine derivative, psoralen derivative or riboflavin.

5. The method of claim 3, wherein the small molecule is a therapeutic agent.

6. The method of claim 2, wherein the analyte is a protein.

7. The method of claim 6, wherein the protein is a prion protein.

8. The method of claim 7, wherein the prion protein is a pathogenic protein.

9. The method of claim 2, wherein the analyte is a cell.

10. The method of claim 9, wherein the cell is a leukocyte.

11. The method of claim 10, wherein the method further comprises treating the starting blood cell suspension with an anti-pathogenic agent.

12. The method of claim 11, wherein the anti-pathogenic agent is an ethyleneimine oligomer, phenothiazine derivative, acridine derivative, psoralen derivative or riboflavin.